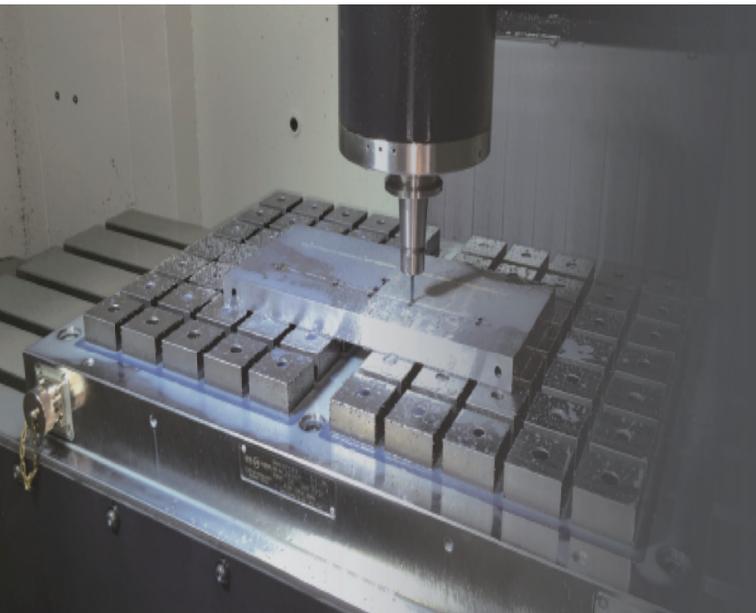




SANGWON ENG

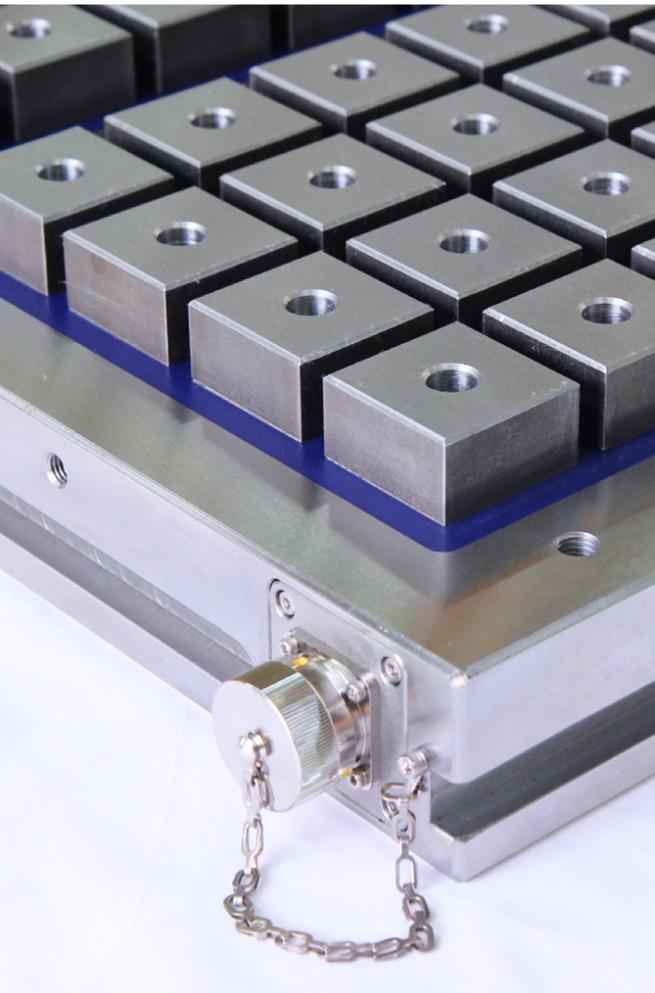
www.swmag.co.kr



**Imagination Becomes
Reality is more.**

Sangwon ENG is

a specialized magnet-applied machine tool manufacturer with accumulated expertise in the manufacture of magnetic chucks used for machining applications of a machine tool.

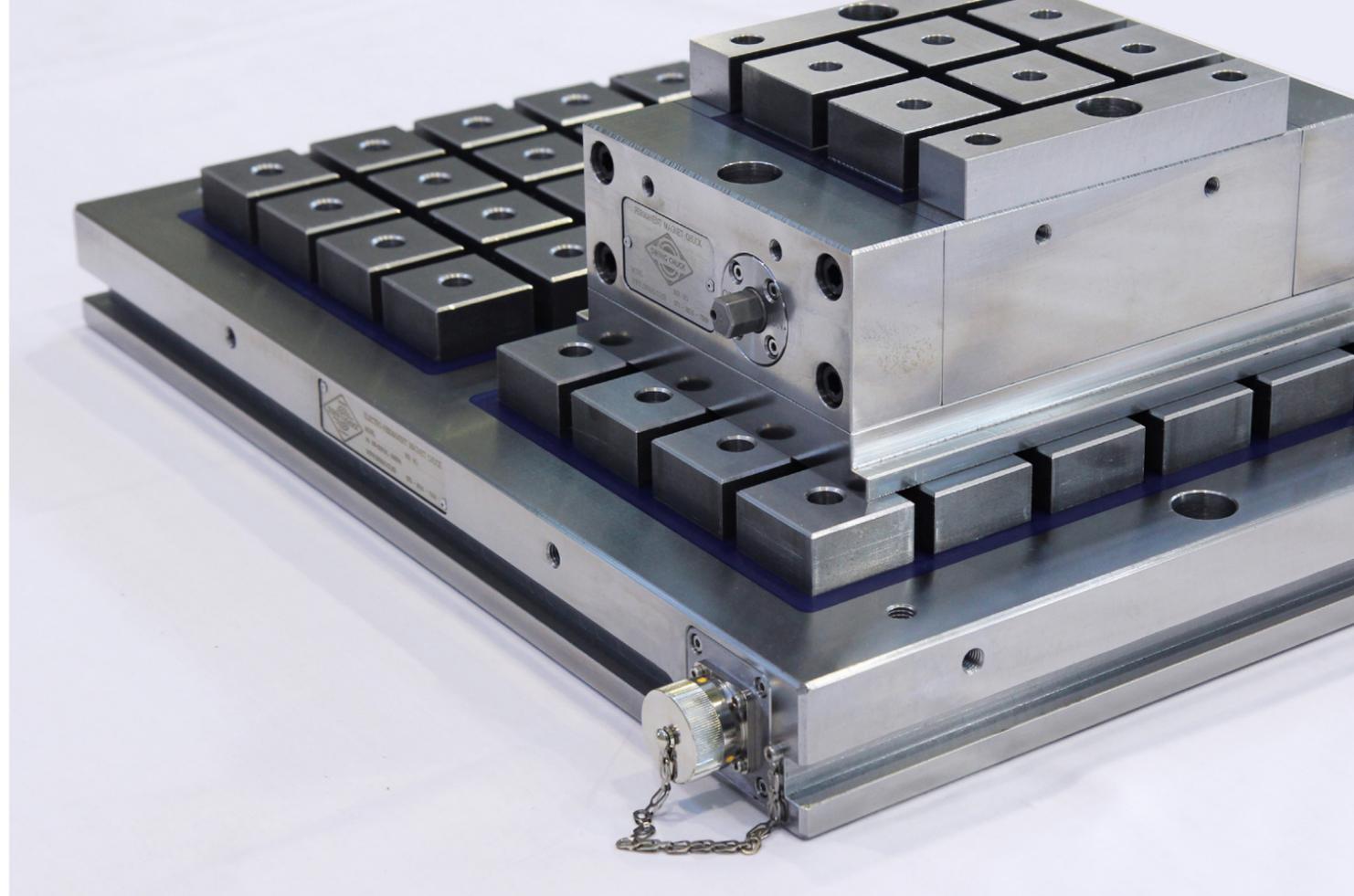


CAD/CAM, tooling, and machining technology have been developing in conjunction with the growth of the machine tool and die industries. As a result, higher product quality and more improved productivity have been sought through this development. However, the limitations of the existing clamping systems hinder the advantages of such development from being completely used in reality.

In this context, we at Sangwon ENG assure you that our magnetic chucks can resolve such limitations, ensuring that we only offer maximized quality and productivity.

We do not hesitate to venture into new changes and challenges. We will never stop making efforts to satisfy customers' expectations and ultimately become a leading magnetic chuck manufacturer through our continued research and development.

Thank you.



CONTENTS

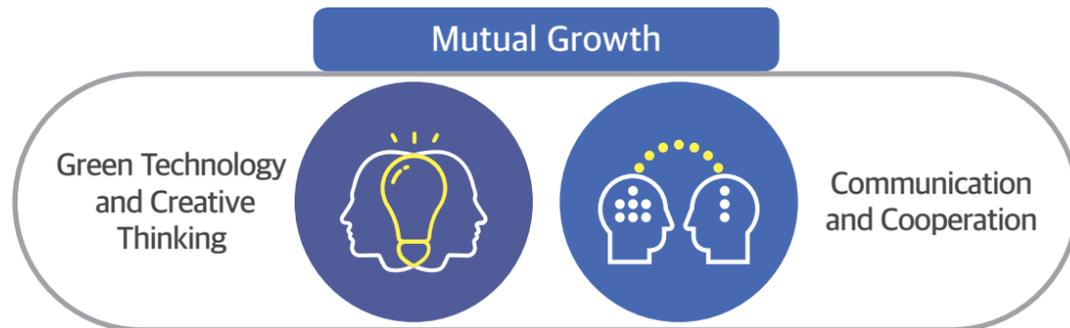
- 01 About us 'SANGWON-ENG'
- 02 Overview of the Magnetic Chuck Technology
- 03 Electro-Permanent Magnetic Chucks
- 04 Permanent Magnetic Chucks

MANAGEMENT PHILOSOPHY



Our focus is on creating the best products and services based on our top-notch workforce and technology to make significant **contributions for the betterment of the human society.**

MISSION



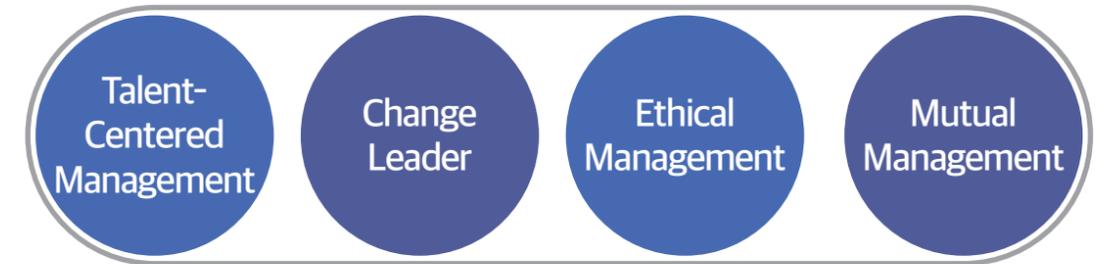
Our mission is to **realize mutual growth between the company and employees** through sincere communication and cooperation based on green technology and creative thinking.

PROSPECT

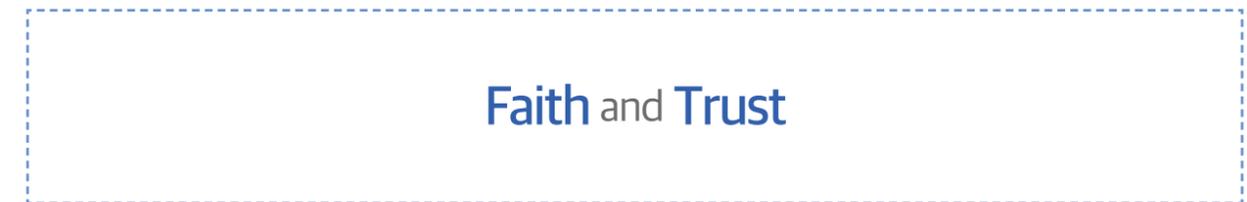


We hope to grow together based on cooperation, as well as become a **global leader** in 2020, through ceaseless change and innovation.

PROSPECT



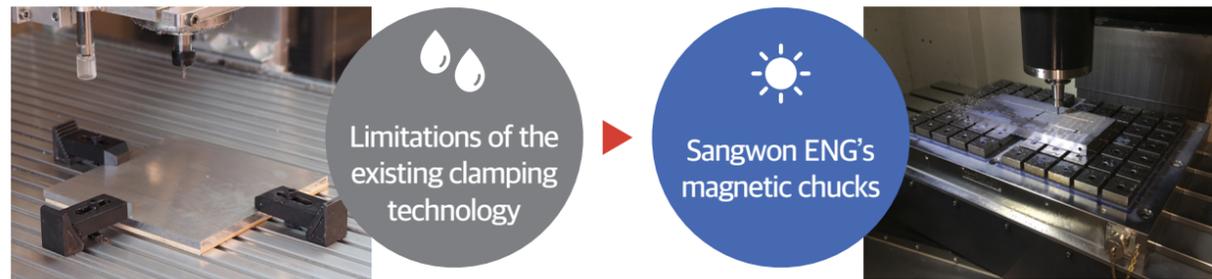
BUSINESS MOTTO



MANAGEMENT PERFORMANCE

Establishment 2014	Growth		At Present 2017
<p>November Founded Sangwon ENG.</p>	<p>May Developed an electro-permanent magnetic chuck.</p>	<p>July Designated as a specialized parts and materials company.</p> <p>October Developed a permanent magnetic chuck.</p> <p>December Completed patent registration for a magnetic chuck.</p>	<p>March Relocated the head office and the factory.</p> <p>July Acquired the ISO 9001 Quality Management System certification.</p> <p>August Launched the R&D Center.</p> <p>September Completed patent registration for a magnetic chuck.</p>

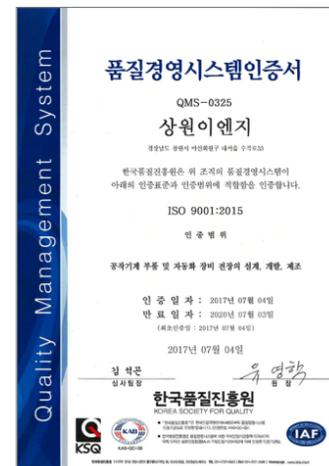
KEY TECHNOLOGY



Patent
Magnetic Chuck System



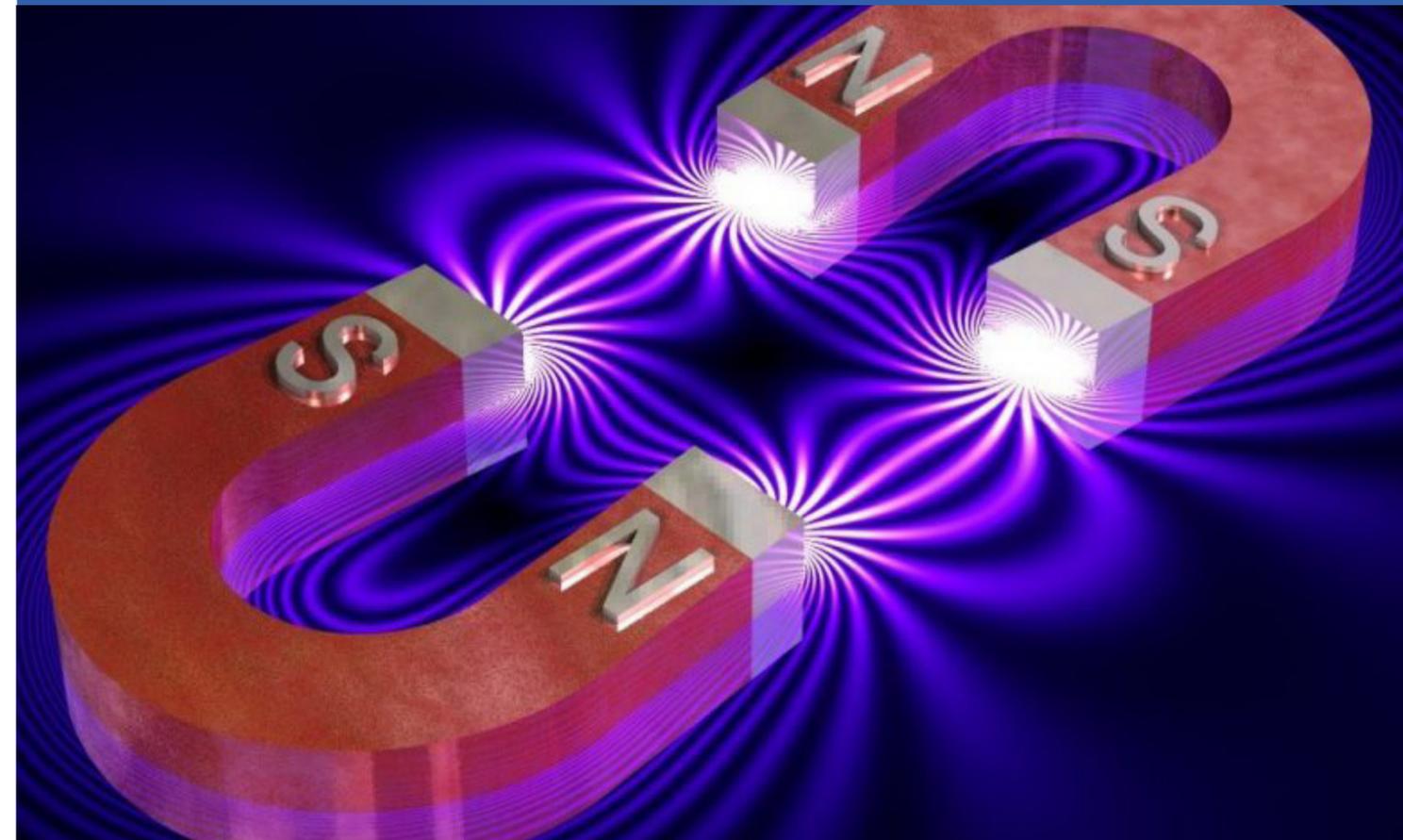
Patent
Magnetic Chuck



Quality Management System
Certification
Design, development, and manufacture of factory machine parts, including electrical and electronic device of automated equipment

2

Overview of the Magnetic Chuck Technology

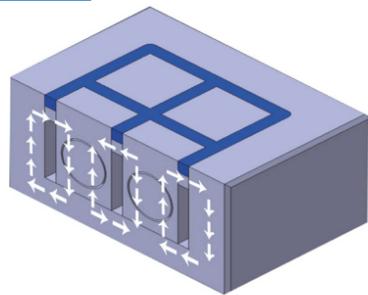


Principles and Features of Magnetic Chucks

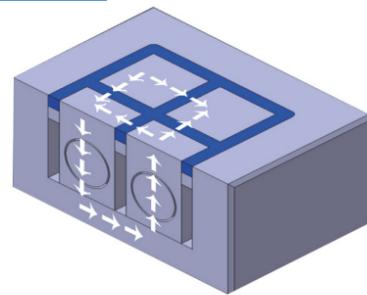
Precisely controlling the principles of a magnet, our products boast of more outstanding effect when clamping workpieces of a machine tool are used compared to fixing jig and other electromagnetic chucks.

2-1 Magnetic Chuck

Magnetism **OFF**



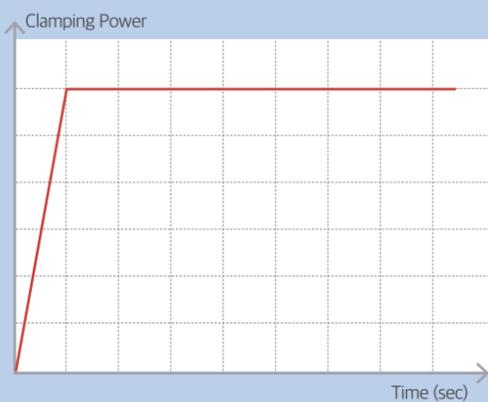
Magnetism **ON**



Each magnetic pole is surrounded by permanent magnets. Magnets wound with a coil of wire that carries an electric current are embedded in the lower parts of each magnetic pole. These coiled magnets can reverse the magnetization directions of the magnetic poles. The magnetization directions can be changed within seconds using the current directions of the wire coil. Consequently, magnetic fields are formed around the magnets, which enable the chuck to clamp workpieces. Conversely, the magnetization directions of the magnetic poles can be internally offset by those of the permanent magnets. This consequently eliminates the magnetic fields around the magnets, thereby demagnetizing the machine tool.



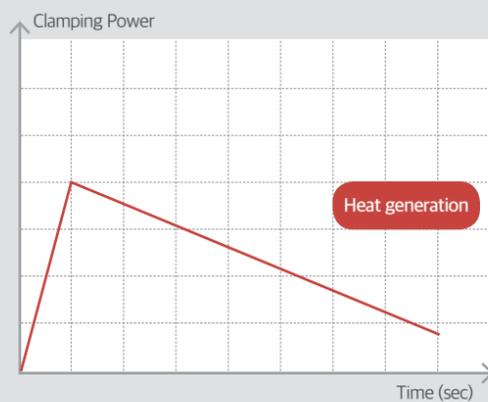
Electro-Permanent Magnetic Chuck | 5.0



- Magnetism occurs within seconds.
- Additional power supply is not required.
- When a machine operates, there is no interference between power lines.
- Magnetism is uniformly and permanently generated.



Electromagnetic Chuck | 3.0

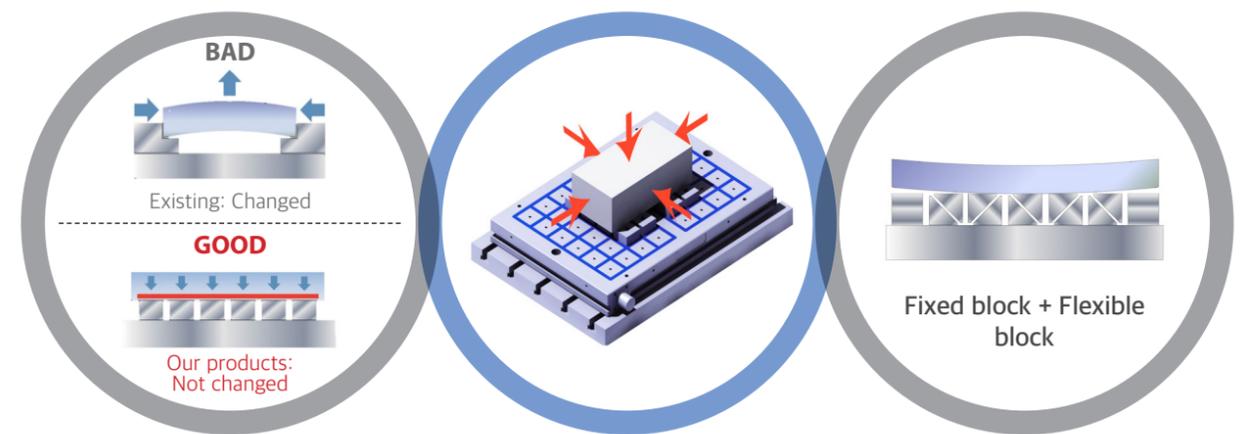
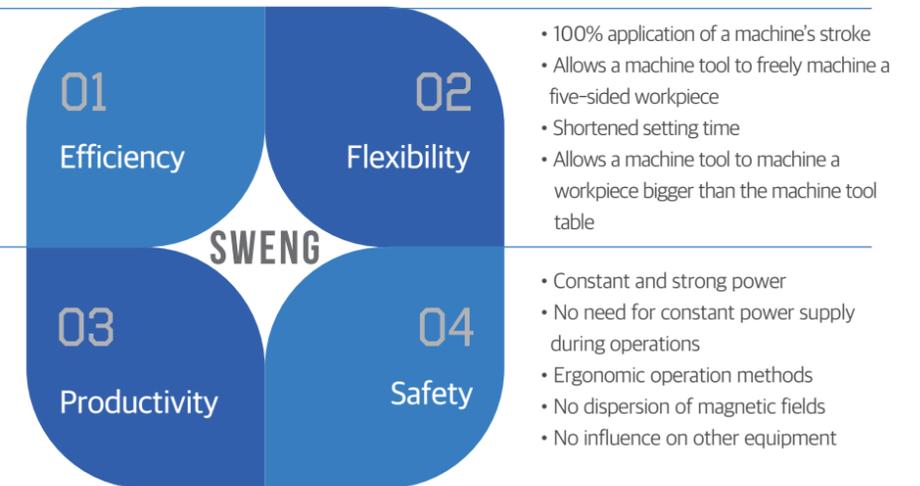


- Electrical power must be constantly supplied even during machining operations.
- When a power outage occurs or there is disconnected power line, defects in machined workpieces may occur.
- Maintenance is difficult.
- Long-term use → Heat generation from the electromagnetic chuck → Decreased clamping power

2-2 Features of Magnetic Chucks

- Reduced facility investment
- Reduced maintenance costs
- Energy saving
- Decreased rate of machine tool consumption
- Semipermanent use

- Easy and fast installation
- Reducing machining time
- Improved surface finish after machining operations
- Higher precision
- Decreased defective rate
- Easy compatibility with CAD/CAM systems



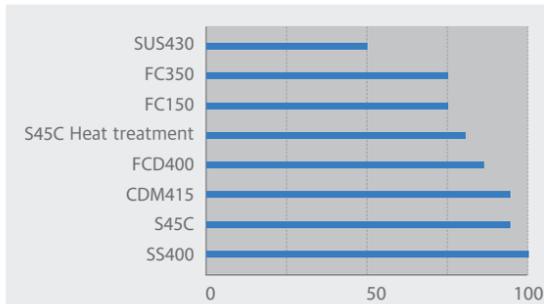
Machining operations without causing any change to materials

Allows machining of a five-sided faced workpiece without the interference of a clamping vise

Allows the machining of curved materials

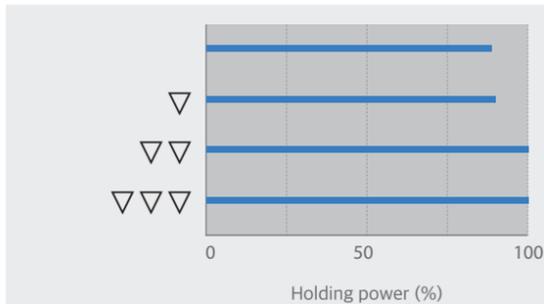
2-3 Precautions When Using Magnetic Chucks

Note that although the magnetism is switched OFF, die steels, SKD11 (H, T) and S45C (H, T), or workpieces with less heat treatment may not be easily disconnected from the chuck because of the residual magnetism on the surface of the workpieces.



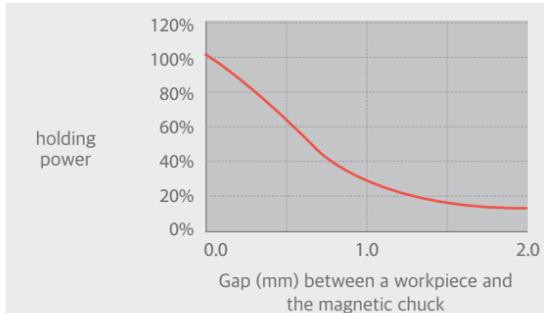
Holding power depends on the **materials** of the workpieces

The holding power of a magnetic chuck depends on the material quality of workpieces. Also, as the holding power is in inverse proportion to the amount of alloys, Stainless 304 is not held at all.



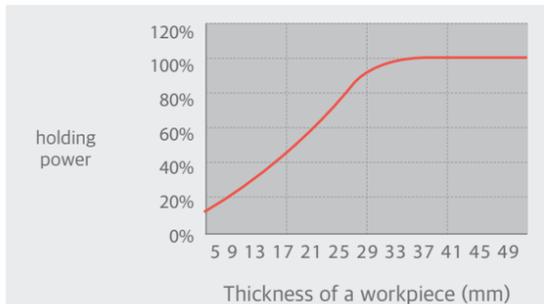
Holding power according to the **surface finish** of workpieces

The surface of a workpiece coming in contact with the magnetic chuck must be even. The less prominent and inclined (close to being horizontal) the surface is, the stronger the holding power is.



Holding power according to the **gap** between the surfaces of a workpiece and the magnetic chuck

If there is a gap between a workpiece and the magnetic chuck because of dust, impurities, and foreign substances, the holding power decreases.



Holding power according to the **thickness** of workpieces

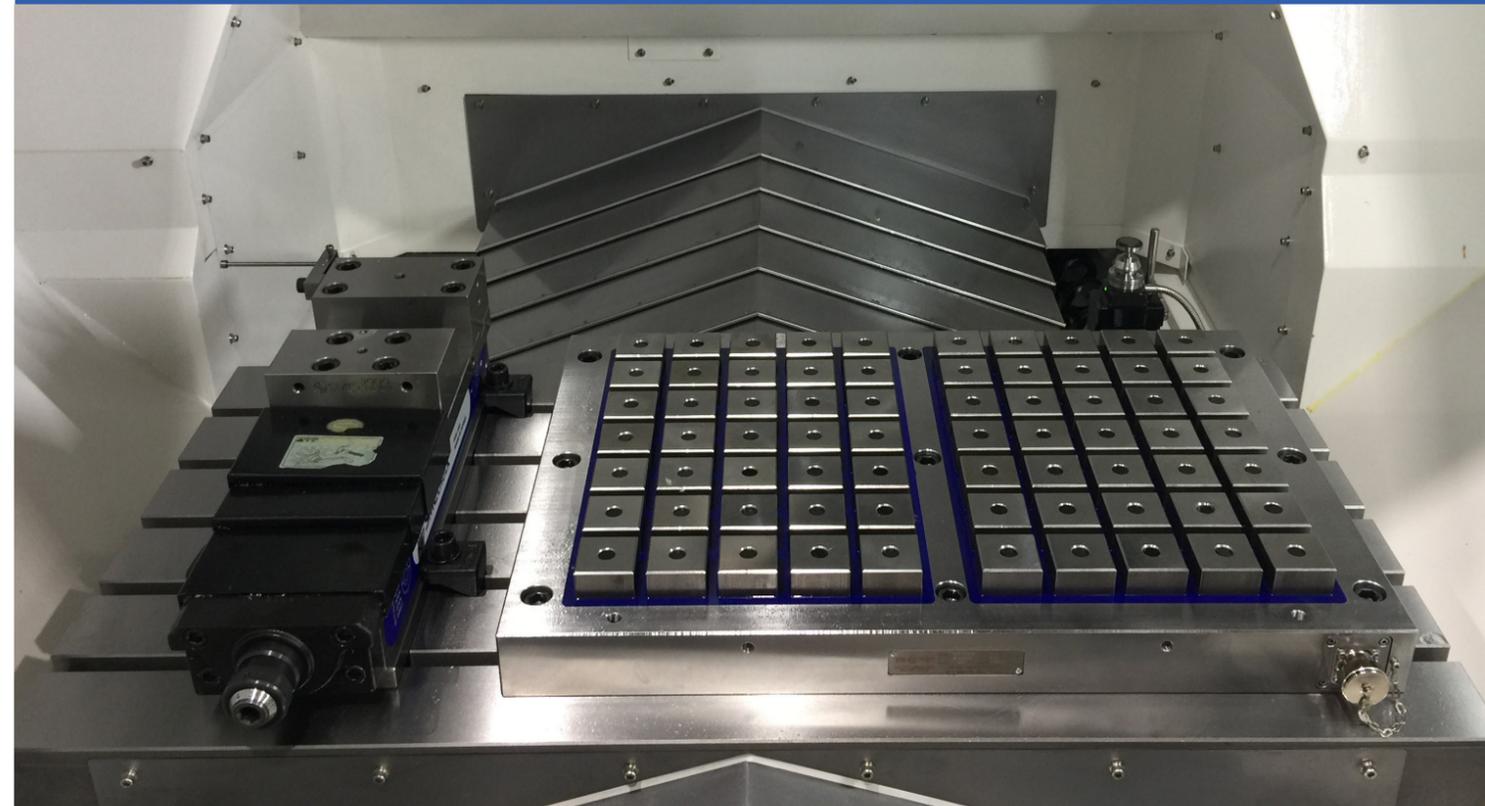
The thinner a workpiece is, the smaller the holding power becomes. In particular, note that for a workpiece with a thickness of 20 mm or below, the holding power exponentially decreases.



3

Electro-Permanent Magnetic Chucks

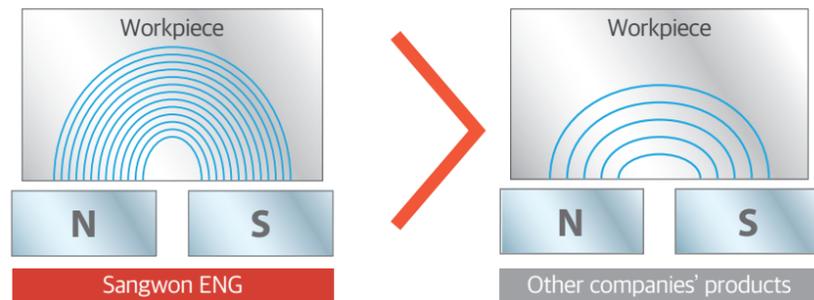
“ A new clamping technology that applies a permanent magnet and electricity that goes beyond your imagination ”



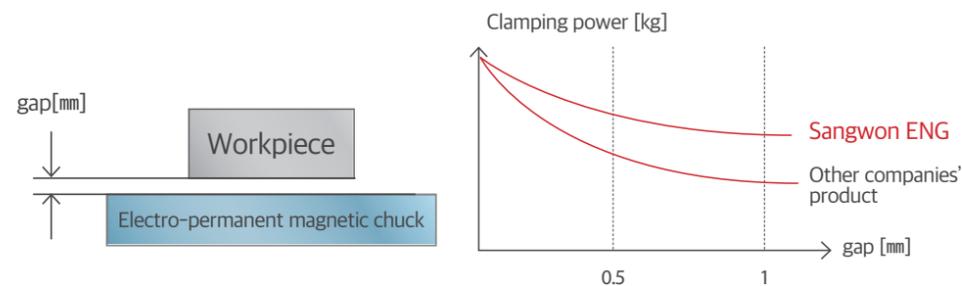
3-1 SSEN CHUCK: Differentiation

- Machining operations can be done to a workpiece with an inclined surface with a higher magnetic flux density such as a cast, a workpiece with an uneven surface, or a small-sized workpiece.
- Structure for easy connector replacement
- Reduced repair costs, thanks to a structure that facilitates further maintenance

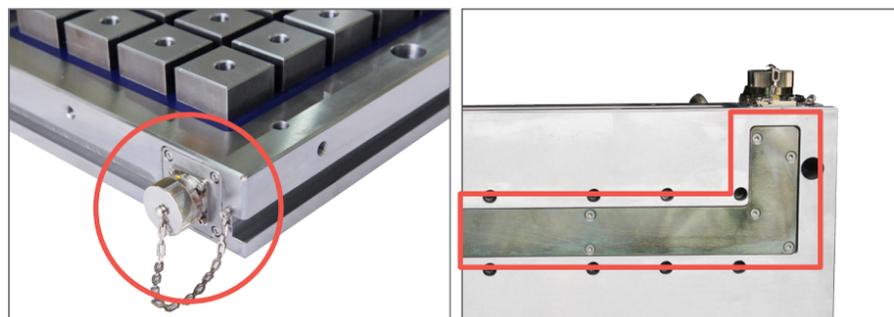
High Magnetic Density



Gap and Clamping Power

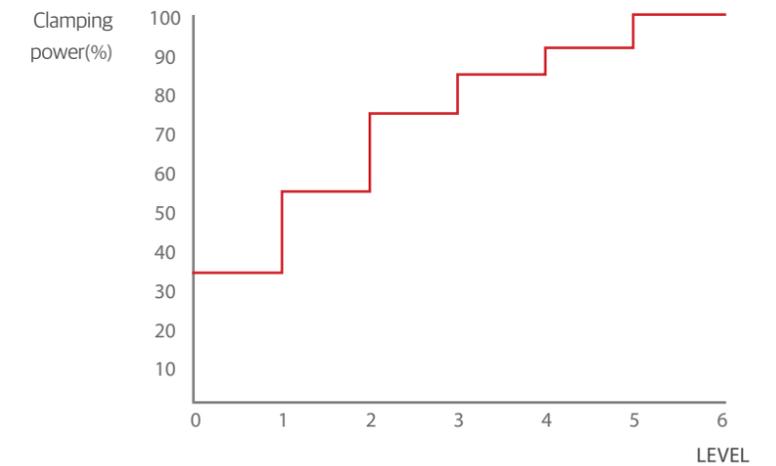


Maintenance



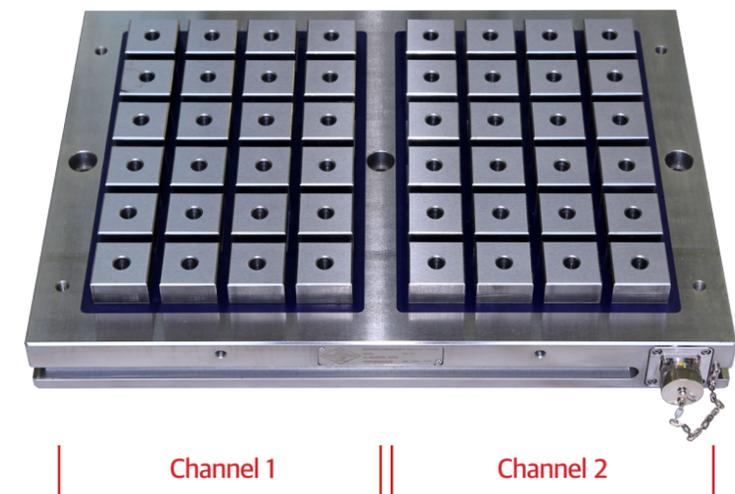
Adjustable Levels of Magnetism

The levels of magnetism are adjustable (Step 1 to Step 6).

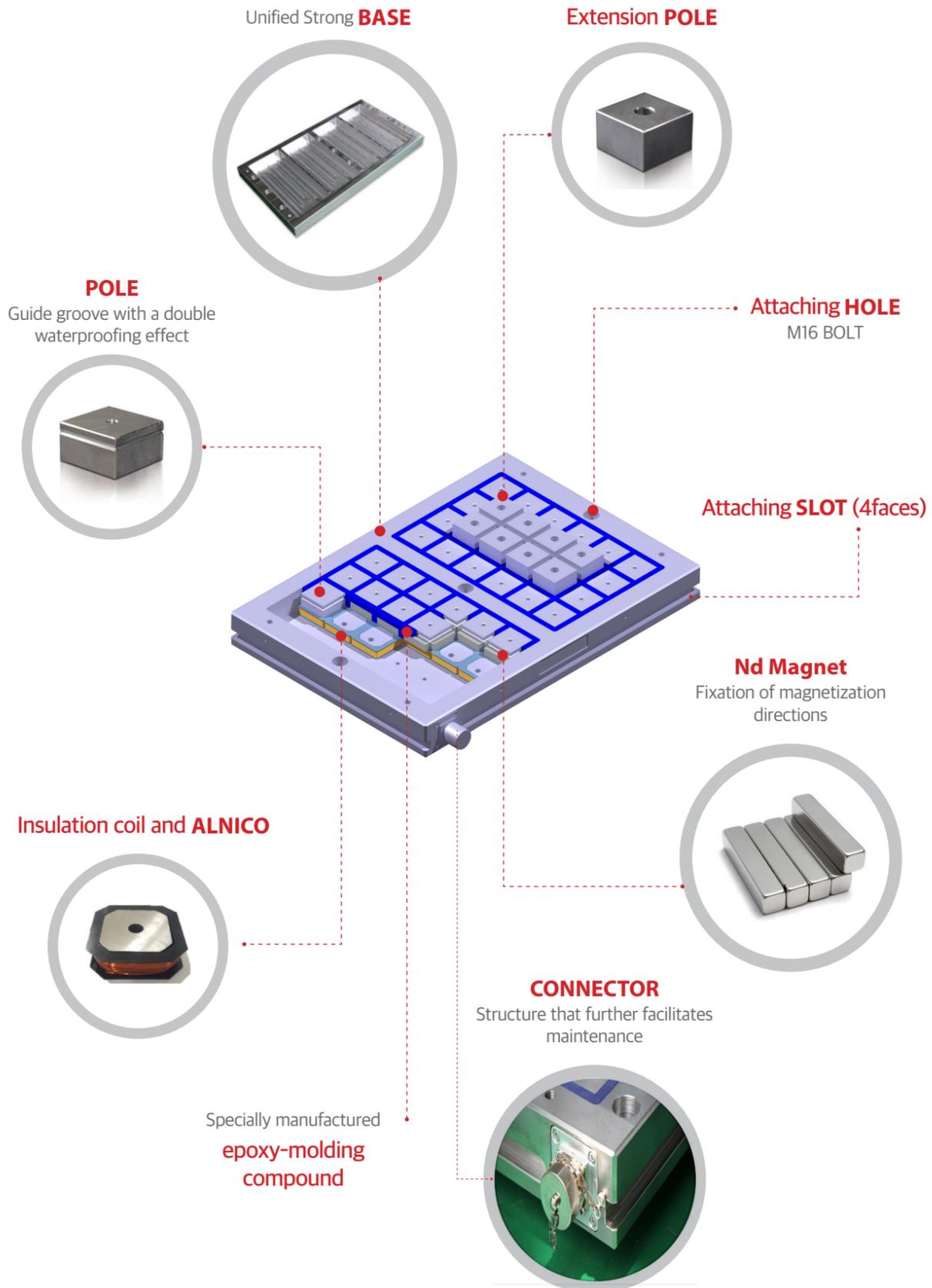


Removable Channels

The channel in use can be divided into channel 1 and channel 2 around the center of the magnetic chuck. Magnetizing and demagnetizing can be done by channel. Moreover, the magnetism intensity can be independently applied by channel.



3-2 Internal Structure of the SSEN CHUCK

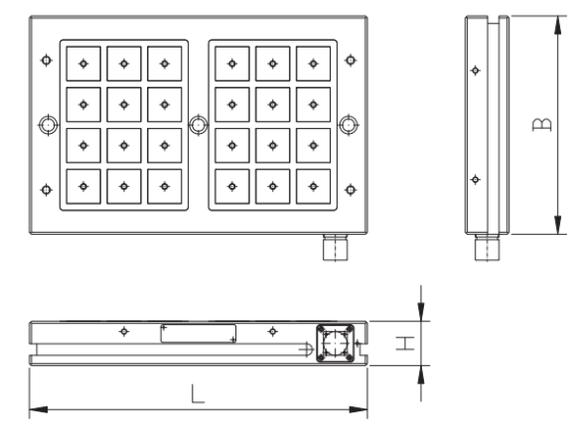


3-3 SSEN CHUCK Models and Specifications



Model	Dimensions (mm)			Weight kg	Poles no.
	B	L	H		
SEP5****					
SEP50203	260	380	65	34	12
SEP50205		500		50	18
SEP50206		620		65	24
SEP50208		740		80	30
SEP50208S		810		87	33
SEP50209		910		94	36
SEP50210	1030	108	42		
SEP50303	320	380	65	44	16
SEP50305		500		65	24
SEP50306		620		84	32
SEP50308		740		104	40
SEP50308S		810		110	44
SEP50309		910		123	48
SEP50310	1030	141	56		
SEP50403	440	380	65	60	24
SEP50405		500		89	36
SEP50406		620		115	48
SEP50408		740		142	60
SEP50408S		810		155	66
SEP50409		910		168	72
SEP50410	1030	193	84		
SEP50503	500	380	65	72	28
SEP50505		500		106	42
SEP50506		620		138	56
SEP50508		740		169	70
SEP50508S		810		185	77
SEP50509		910		200	84
SEP50510	1030	230	98		
SEP50603	620	380	65	88	36
SEP50605		500		130	54
SEP50606		620		169	72
SEP50608		740		207	90
SEP50608S		810		225	99
SEP50609		910		246	108
SEP50610	1030	282	126		

SEP → Model Series
5 → Pole Size
0203 → Body Size



Other than our standardized products, our magnetic chucks that come in different sizes or shapes may also be customized.
 e.g.) Side slots, connector directions, attaching holes, etc

3-4 SSEN CHUCK Composition

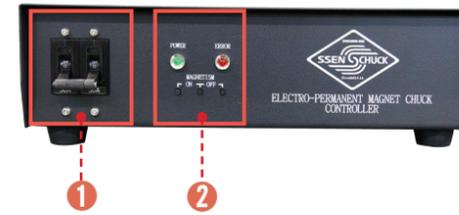


- 1 Electro-permanent magnetic chuck
- 2 Controller (2-2CH, 2-4CH, 4-4CH / 5-meter power cable)
- 3 Wired remote controller (3,5-meter electric wire)
- 4 Extension block (square-shaped)
- 5 Wrench bolt with a six-sided head
- 6 Eye bolt
- 7 3,5-meter chuck cable
- 8 Fixing clamp

Some components (controller, extension block, and chuck cable) can be additionally purchased.

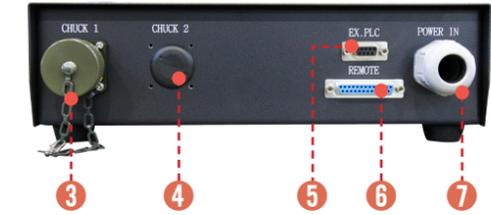
3-5 SSEN CHUCK Controller

Front Side



- 1 Circuit protector for safety
- 2 Built-in switch for magnetizing/demagnetizing in response to an emergency

Rear Side



- 3 Magnetic Chuck (1) connector
- 4 Magnetic Chuck (2) connector
- 5 External PLC controlling connector
- 6 Wired remote controller connector
- 7 Power cable of the controller

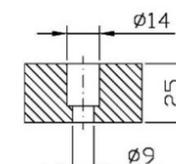
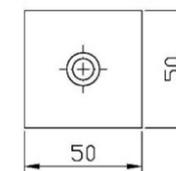
Wired Remote Controller



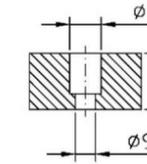
- 1 Magnetism control
- 2 Magnetizing and demagnetizing
- 3 Channel selection

3-6 Other SSEN CHUCK Accessories

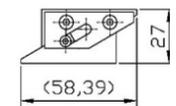
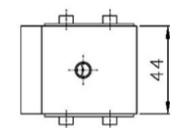
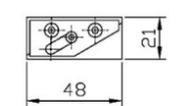
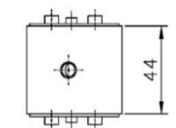
Fixed Extension Pole | FEB 50-25S



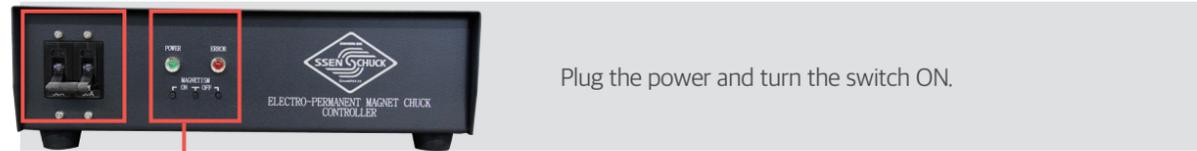
Fixed Extension Pole | FEB 50-25C



Flexible Extension Pole | TEP50-25S



3-7 How to Operate the SSEN CHUCK



Plug the power and turn the switch ON.



If the remote controller is broken, use the Controller to select channels.



Magnetizing Method to Hold a Workpiece

Simultaneously press the magnetizing button and the safety button to activate the magnetizing function.



Demagnetizing Method to Disconnect a Workpiece

Simultaneously press the demagnetizing button and the safety button to activate the demagnetizing function.



Magnetism Control

Use the (+) and (-) buttons to control the magnetism.

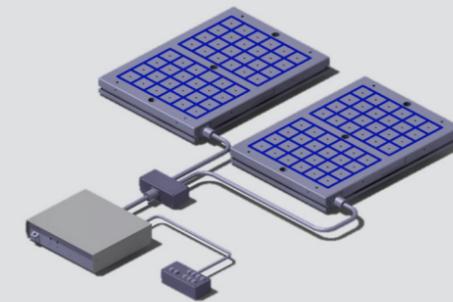


Channel Selection

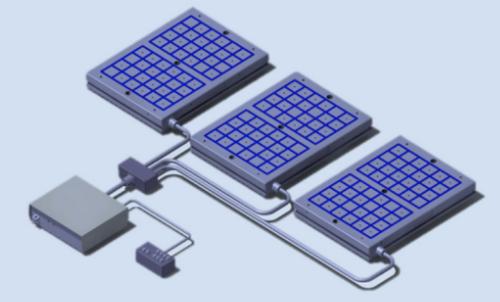
Use the CH1 and CH2 buttons to select the channels.

3-8 SSEN CHUCK Extension and Installation

Two Magnetic Chucks
 One Control Unit for two channels or four channels
 One Junction Box
 One Wired Remote Controller



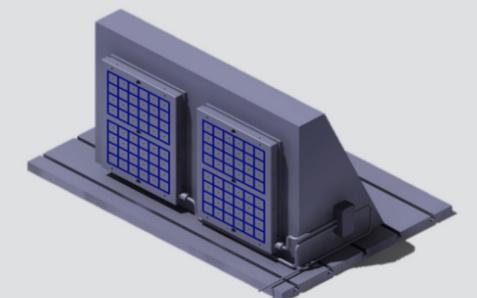
Three Magnetic Chucks
 One Control Unit for three channels or six channels
 One Junction Box
 One Wired Remote Controller

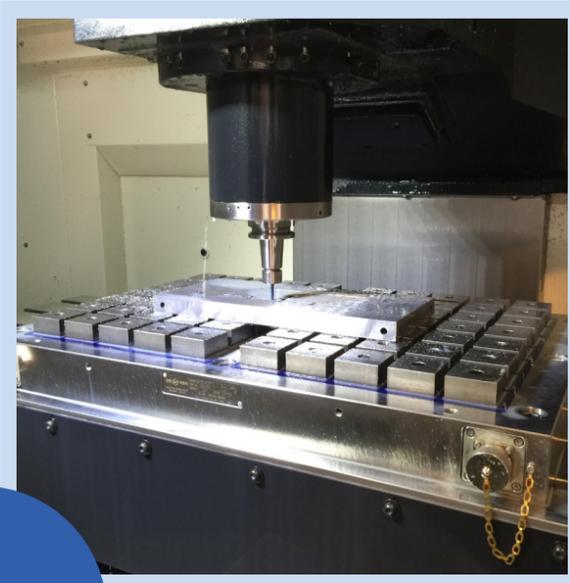
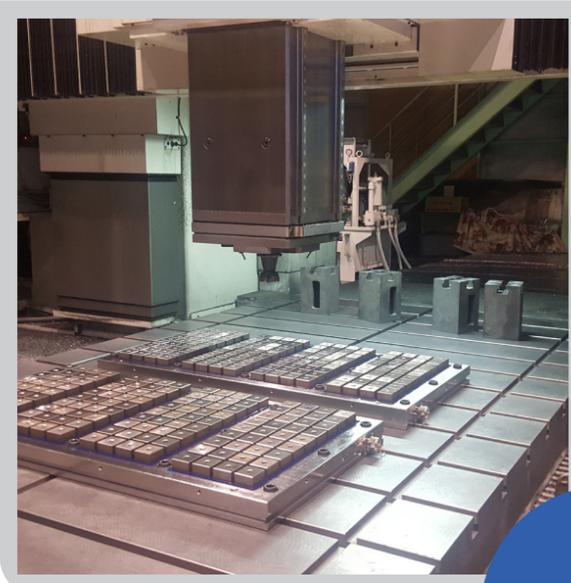


Four Magnetic Chucks
 One Control Unit for four channels or eight channels
 One Junction Box
 One Wired Remote Controller

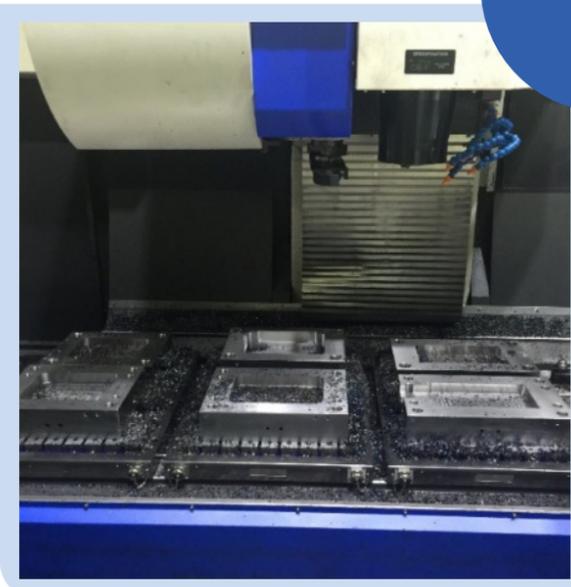


Two Magnetic Chucks
 One Control Unit for two channels or four channels
 One Junction Box
 Three Wired Remote Controllers





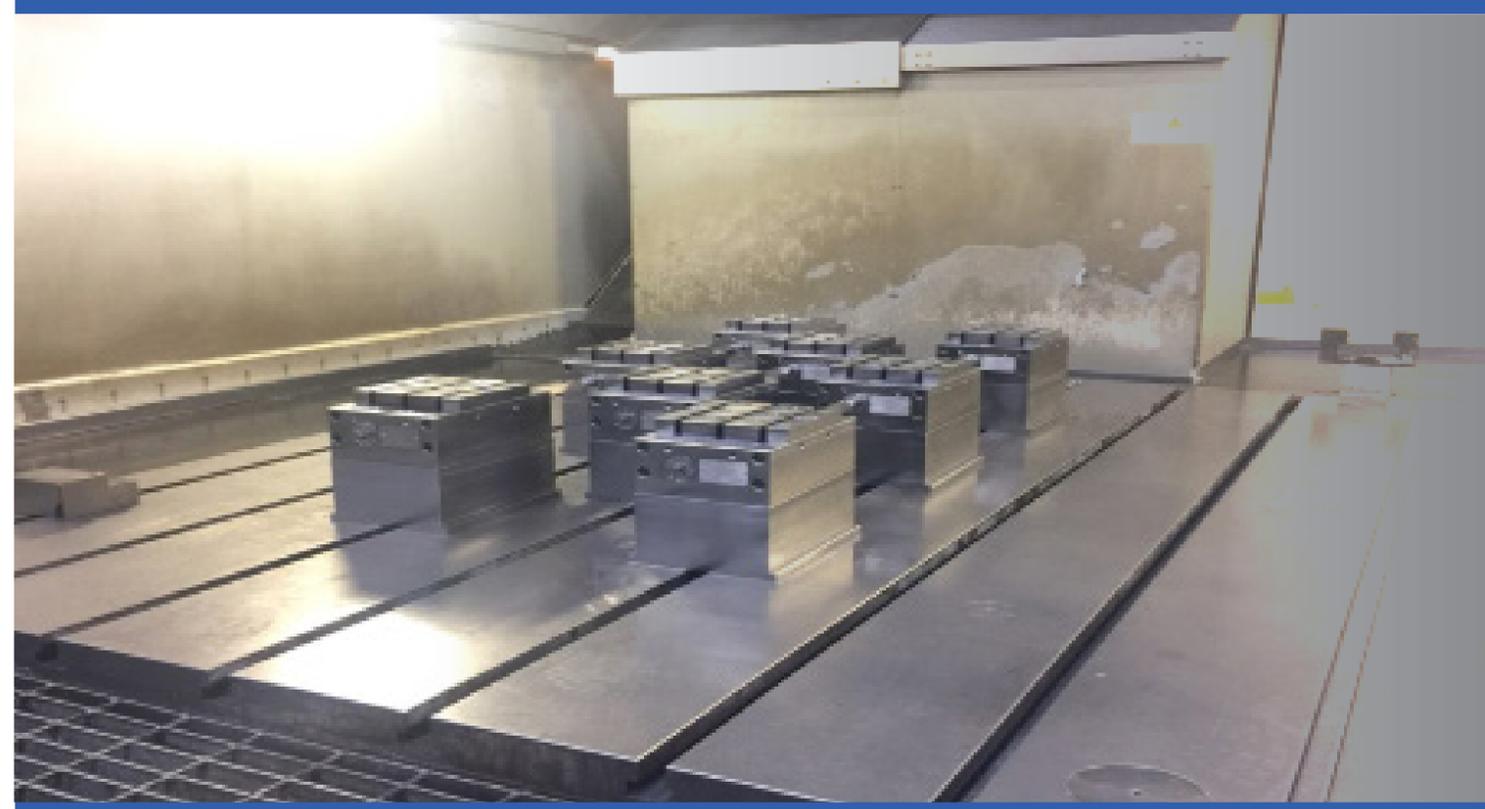
SSEN CHUCK



4

Permanent Magnetic Chucks

“Our new clamping technology lets you take the lead in machining technology.”



SWING CHUCK

Permanent Magnetic Chuck

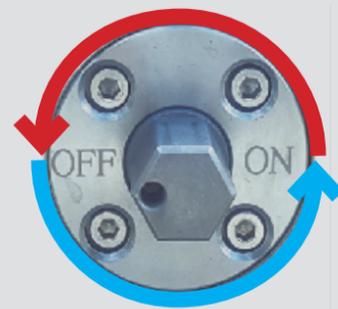
4-1

Unique Features of the SWING CHUCK

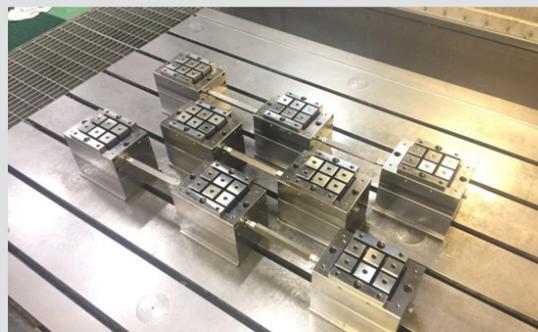
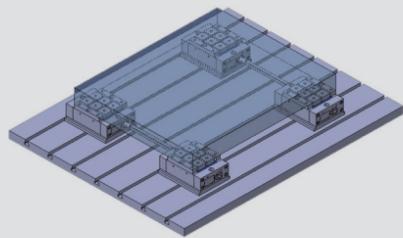
01 No need for power supply



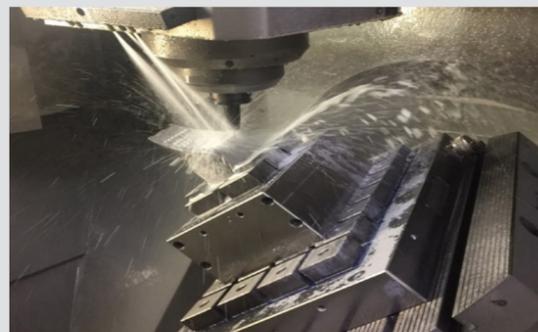
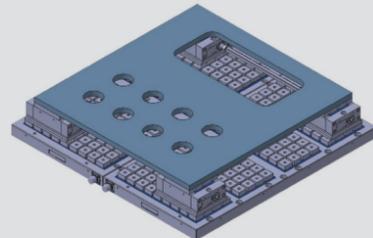
02 Easy operation to turn magnetism ON or OFF



03 Convenient extension : axial connection



04 Flexibility : connectable with the magnetic chuck



4-2

SWING CHUCK Structure

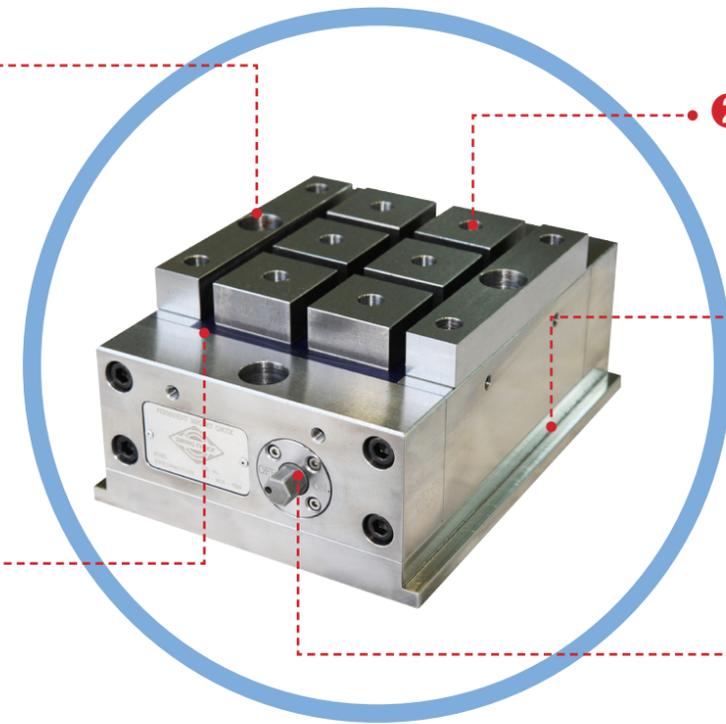
3 Attaching HOLE

2 Extension POLE

4 Side CLAMP

5 Epoxy

1 Handlebar



1 Handlebar | For turning magnetism ON or OFF (15 mm, HEX)

2 Extension POLE | For protecting products and matching a floor plan with a machine table through its self-cutting function.

3 Attaching HOLE | Using the holes located in four directions, installation restrictions caused by the direction of the T-slot of a machine tool table (M16) are resolved.

4 Side CLAMP | If the T-slot cannot be installed, a clamp can be used to complete the installation.

5 Epoxy | For preventing the inflow of foreign substances.

4-3 **SWING CHUCK**
Composition



SWING CHUCK
(permanent magnetic chuck)



EXTENSION BAR
(Connection rod)

Customization is possible. / When two sets or more are used, the length can be adjusted depending on the installation conditions.

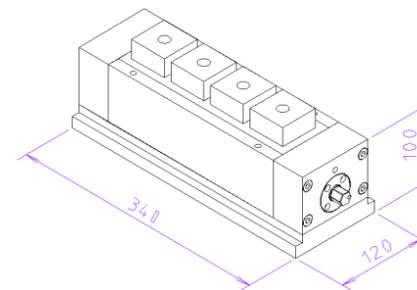


HINGE HANDLE(1/2" 15mm)
(Handlebar)

ON/OFF operation through 180° rotation

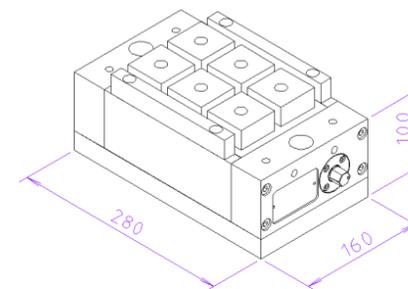
4-4 **SWING CHUCK** Models and Specifications

Model name : SMP501030-4



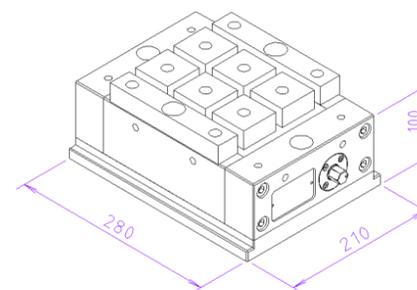
Pole no. : 4 Pole
ON/OFF axis : one axis
Weight : 22kg
Feature : fixed with a fixing jig plate

Model name : SMP501530-6V



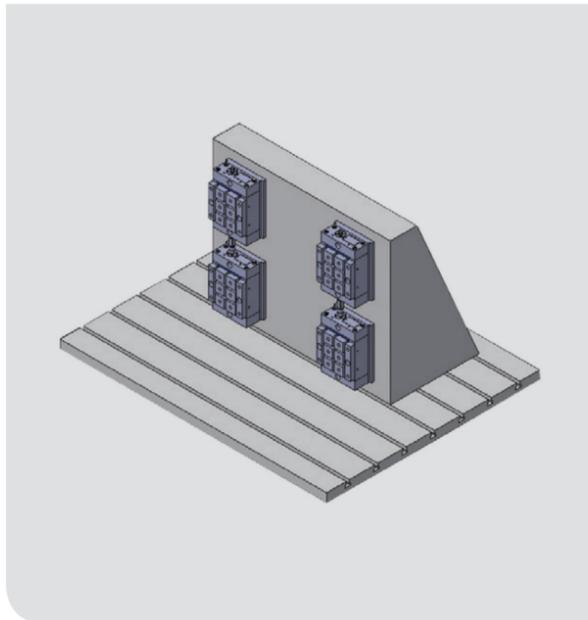
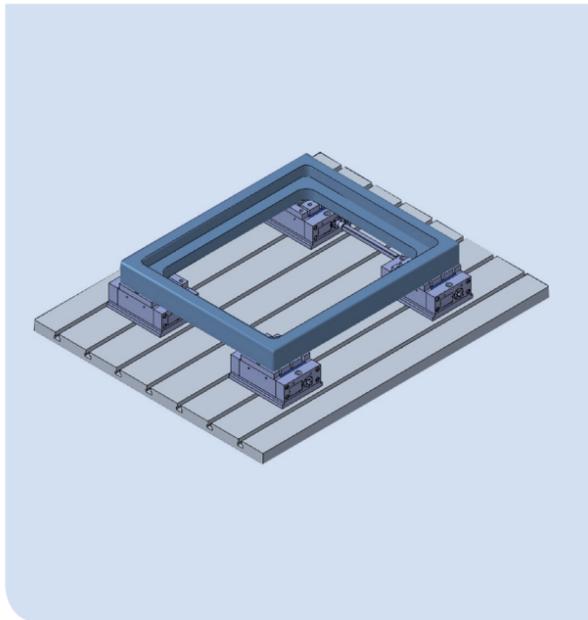
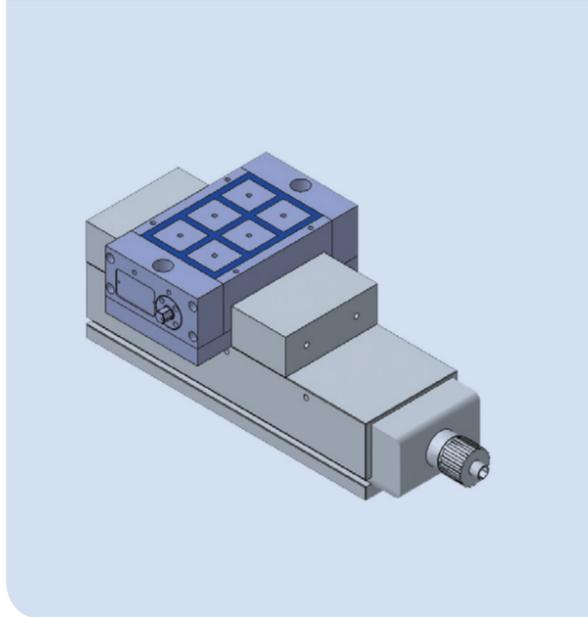
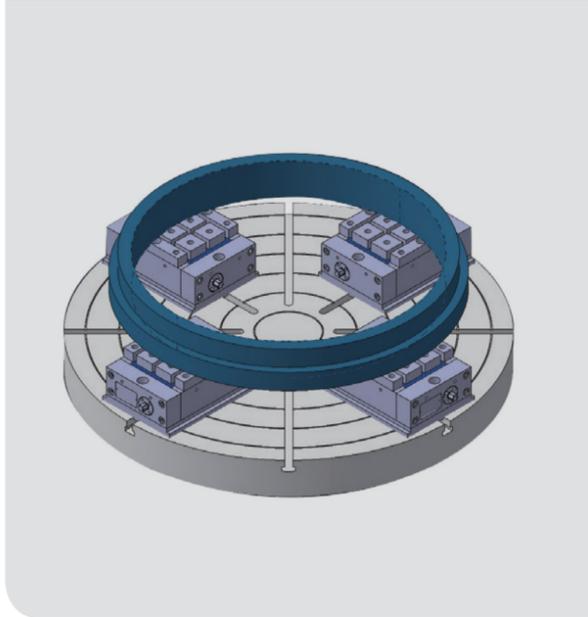
Pole no. : 6 Pole
ON/OFF axis : one axis
Weight : 34kg
Feature: engaged with a milling vise

Model name : SMP502030-6



Pole no. : 6 Pole
ON/OFF axis : two axis
Weight : 37kg
Feature : can be extended by connecting the front axis with the rear one

4-5 **SWING CHUCK** Extension and Installation



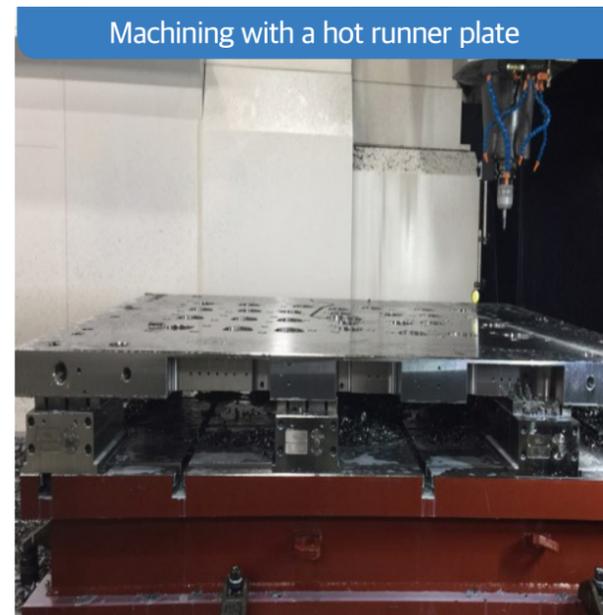
4-6 (Photo) **SWING CHUCK** Installation



Connected with the electro-permanent magnetic chuck



Five-axis machining tool (securing a stroke)



Machining with a hot runner plate



Connected with two units



Interlocked with a vise

Imagination become reality is more



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